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CNC CHARLESTON  
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ASSESSMENT REPORT FOR FUEL DISTRIBUTION SYSTEM FOR 22 ZONE G CNC  
CHARLESTON SC  
07/01/2005  
CH2M HILL

# CH2M-JONES, LLC.



Mr. Andrew W. O'Conor  
CH2M-Jones LLC.  
1330 Kilo Street  
North Charleston, SC 29405

July 25, 2005

Mr. Michael A. Bishop  
SCDHEC  
2600 Bull Street  
Columbia, SC 29201-1708

Subject: Assessment Report, July 2005  
FDS 22, Zone G  
**Site ID. No. 02401**  
Charleston Naval Complex

Dear Mr. Bishop:

CH2M-Jones has completed the FDS 22, Zone G assessment report for your review. If you have questions please do not hesitate to call. I may be reached at 843-200-3825.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew W. O'Conor".

CH2M HILL

Andrew W O'Conor  
843.200.3825  
aoconor@ch2m.com

**RECEIVED**  
JUL 26 2005  
Water Monitoring Assessment & Protection Division  
Assessment & Protection Division

**Assessment Report  
Fuel Distribution System: 22, Zone G  
Charleston Naval Complex  
North Charleston, South Carolina  
UST Permit No. 02401**

**Prepared by:  
CH2M-Jones  
Charleston Naval Complex  
1330 Kilo St.  
North Charleston, South Carolina 29405**

**Prepared for:  
Southern Division Naval Facilities Engineering Command  
P.O. Box 190010  
North Charleston, South Carolina 29419-9010**

**July 2005**

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# 1 Acronyms and Abbreviations

2	µg/L	micrograms per liter
3	bls	below land surface
4	BTEX	benzene, toluene, ethylbenzene, and xylene
5	CA	Corrective Action
6	CAP	Corrective Action Plan
7	CNC	Charleston Naval Complex
8	COC	chemical of concern
9	CPW	Commissioner of Public Works
10	EPA	U.S. Environmental Protection Agency
11	MTBE	methyl-tert-butyl ether
12	NAVBASE	Naval Base
13	PAH	polycyclic aromatic hydrocarbon
14	ppb	parts per billion
15	RBSL	risk-based screening level
16	SCDHEC	South Carolina Department of Health and Environmental Control
17	SVOC	semivolatile organic compound
18	Tetra Tech	Tetra Tech NUS, Inc.
19	UST	underground storage tank
20	VOC	volatile organic compound

## 1 1.0 Introduction

### 2 1.1 Background

3 In 1993, Naval Base (NAVBASE) Charleston was added to the list of bases scheduled for  
4 closure as part of the Defense Base Realignment and Closure Act, which regulates closure  
5 and transition of property to the community. The Charleston Naval Complex (CNC) was  
6 formed as a result of the dis-establishment of the Charleston Naval Shipyard and NAVBASE  
7 on April 1, 1996. The South Carolina Department of Health and Environmental Control  
8 (SCDHEC) has not designated a site Identification Number:

### 9 1.2 General Site Description

10 The CNC is located in the City of North Charleston, South Carolina, as shown on Figure 1.  
11 This installation consists of two major areas: (1) an undeveloped dredge materials area on  
12 the east bank of the Cooper River on Daniel Island in Berkley County, and (2) a developed  
13 area on the west bank of the Cooper River. The developed portion of the base is on the  
14 peninsula bounded on the west by the Ashley River and on the east by the Cooper River.  
15 This site is located within the developed portion of the base.

16 FDS 22, of the Fuel Distribution System (FDS), is located near Building 451C, which is an  
17 electrical substation built in 1943. FDS 22 is located in the north-central part of Zone G, just  
18 east of the intersection of Viaduct Road and Hobson Avenue.

## 19 2.0 Site Geology and Hydrogeology

20 According to the December, 2003, Corrective Measures Study Report, prepared by CH2M-  
21 Jones LLC, the soils from land surface to depths of approximately six feet are a mixture of  
22 artificial fill and native sediments due to the extensive soil disturbance at the CNC over the  
23 history of its operation. In undisturbed areas, surface deposits consist of Quaternary age (   
24 Holocene epoch to recent) fine grained sands, silts and clays typical of a coastal plain  
25 environment. The deepest unit identified in Zone G is the Ashley Formation, a member of  
26 the mid-Tertiary period Cooper Group. Overlying the Ashley Formation are the younger  
27 upper Tertiary and Quaternary period deposits, which are overlain by the Holocene to  
28 recent surface soils.

JULY 2005

## 1    3.0 Previous Investigations

2    Site FDS 22 is located in Zone G of the CNC immediately adjacent to RCRA site AOC 633.  
3    According to the March 2003, *RFI Report Addendum and CMS Work Plan* for AOC 633,  
4    petroleum- based dissolved phase hydrocarbons were detected within monitoring well  
5    G633GW004 thought to be associated with an old fuel distribution system (FDS) as opposed  
6    to the AOC 633 source. The hydrocarbon contamination in the vicinity of well 633GW004 is  
7    being addressed under the South Carolina DHEC UST Program.  
  
8    On September 4, 2003, CH2M-Jones LLC, collected groundwater samples from three Direct  
9    Push Technology (DPT) locations (F22GP001, F22GP002, and F22GP003) around monitoring  
10   well 633GW004, which are presented in Figure 2. Results of the DPT samples showed no  
11   detections of COCs. Groundwater analytical results for the September 4, 2003, sampling  
12   event are presented in Table 1 and graphically depicted on Figures 3. As noted on the chain  
13   of custody and due to the tight formation, only VOCs were taken from F22GP002. Analytical  
14   laboratory data sheets are presented in Appendix C.

## 15    4.0 Groundwater Analytical Results May 17, 2005

16   Monitoring well 633GW004 was sampled on May 17, 2005, for VOCs and SVOCs. No free  
17   product was detected during the sampling event. Prior to collecting groundwater samples,  
18   each well was purged using a low-flow peristaltic pump. Water levels were measured and  
19   the volume of water in each well was calculated prior to purging activities. Groundwater  
20   parameters, including pH, conductivity, turbidity, temperature, dissolved oxygen and  
21   oxygen reduction potential, were measured following the purge of each well volume. Once  
22   the groundwater parameters became stable and at least three well volumes were removed,  
23   the groundwater samples were collected, placed on ice, and delivered to GEL Laboratories  
24   in Charleston , South Carolina. Field data sheets are presented in Appendix A.  
  
25   Groundwater from purging was placed in a 55-gallon drum, labeled, and transported to the  
26   less-than-90-day storage area until final disposition. Approximately 4 gallons of purge water  
27   were properly disposed via the sanitary sewer following approval from the City of North  
28   Charleston Sewer District. A copy of the disposal manifest is presented in Appendix B.

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- 1 Results of the laboratory analysis indicate that 633GW004 had concentrations of benzene at  
2 29.9 ppb and naphthalene at 2180 ppb which are above their respective RBSLs.  
3 Groundwater analytical results for the May 13, 2005, sampling event are presented in Table  
4 1 and graphically depicted on Figures 3. Analytical laboratory data sheets are presented in  
5 Appendix D.

## 6 **5.0 Potentiometric Surface**

- 7 The groundwater flow direction was interpreted from water level information taken from  
8 AOC 633 site monitoring wells on October 2, 2002. The map indicates that the groundwater  
9 flow is generally to the south west from the FDS location.

## 10 **6.0 Conclusions**

- 11 Three DPT groundwater samples were collected to define the hydrocarbon contamination  
12 around 633GW004. The results of the DPT samples indicated no presence of COCs, thereby  
13 defining the extent of the hydrocarbon contamination in the area of 633GW004. The  
14 Analytical results from the sample collected at monitoring well 633GW004 on May 17, 2005,  
15 indicated the presence of benzene and naphthalene above their respective RBSLs. Because  
16 groundwater results are above screening criteria, CH2M-Jones recommends annual  
17 monitoring of 633GW004 . The next sampling event would be May 2006.

## 18 **7.0 References**

- 19 CH2M-Jones LLC. *Corrective Measures Study Report, AOC 633, Zone G. Charleston Naval*  
20 *Complex, North Charleston, South Carolina. December 2003.*

## **Tables**

**Table 1**

**DPT Groundwater Analytical Data**

Monitoring Well	Measurement Date	Benzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Ethylbenzene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )	Naphthalene ( $\mu\text{g/L}$ )
Risk Based Screening Levels:		5	1,000	700	10,000	25
F22GP001	09/04/2003	<1.0	<1.0	<1.0	<3.0	<1.0
F22GP002	09/04/2003	<1.0	<1.0	<1.0	<3.0	<.96
F22GP003	09/04/2003	<1.0	<1.0	<1.0	<3.0	NA

J Estimated value

< Below value at detection limit shown

$\mu\text{g/L}$  Micrograms per Liter

NA Not analyzed

**Table 2**  
**Groundwater Analytical Data**

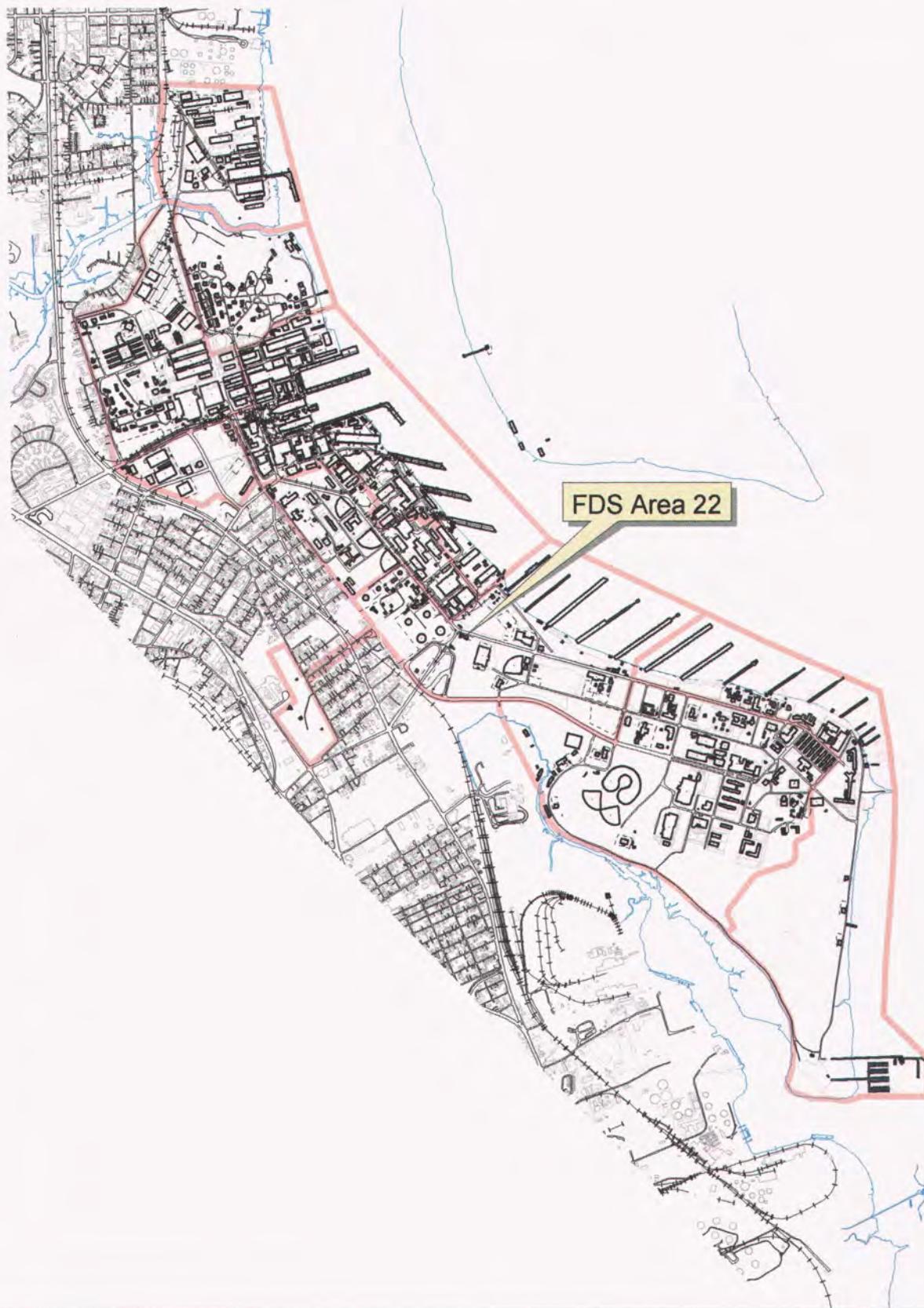
Monitoring Well	Measurement Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Naphthalene (µg/L)
Risk Based Screening Levels:		5	1,000	700	10,000	25
633GW004	05/17/2005	29.9	13.0	38.8	63.5	2180.0

J Estimated value

< Below value at detection limit shown

µg/L Micrograms per Liter

## **Figures**

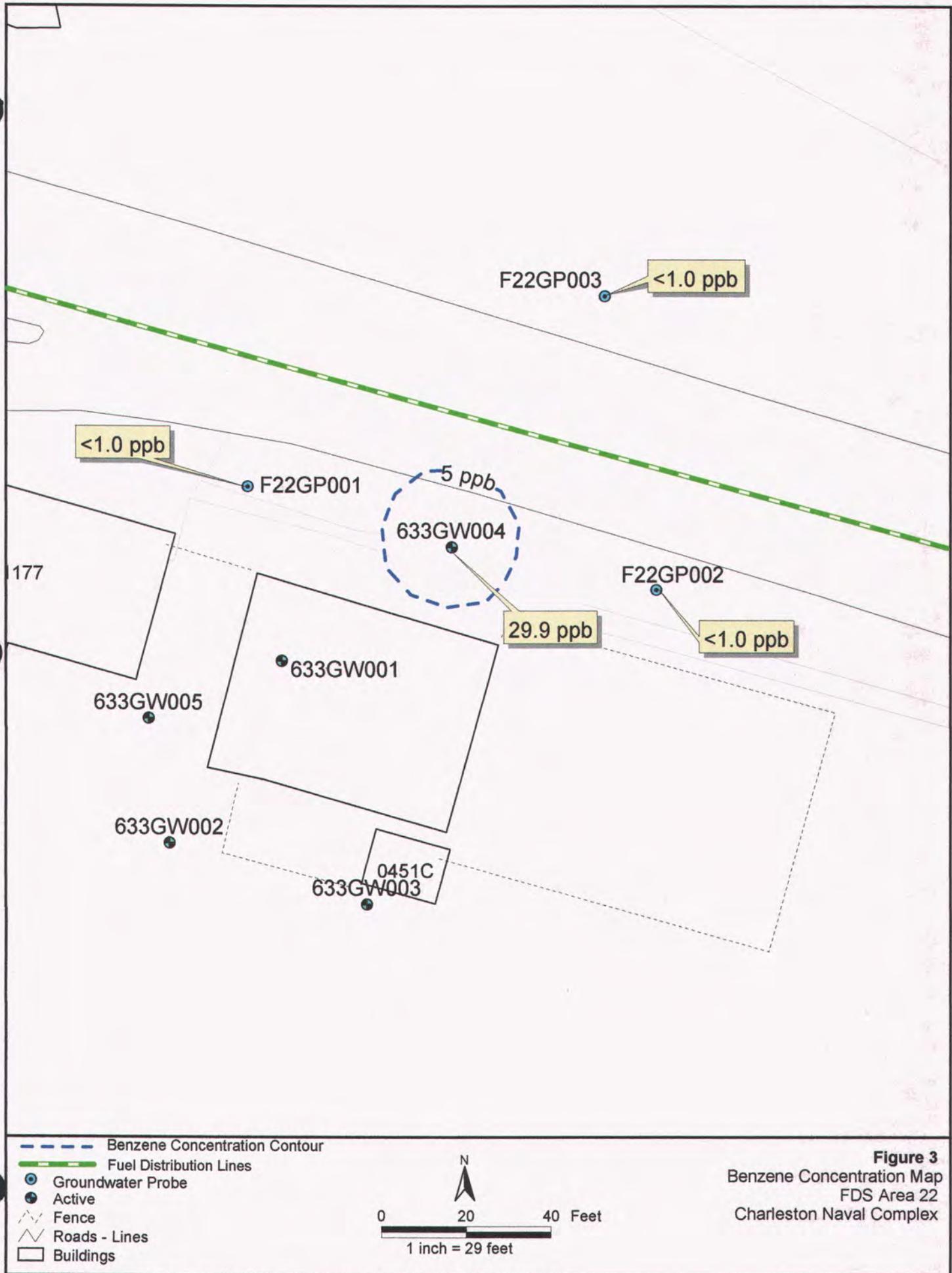


- ▲ Fence
- ~ Roads - Lines
- Buildings

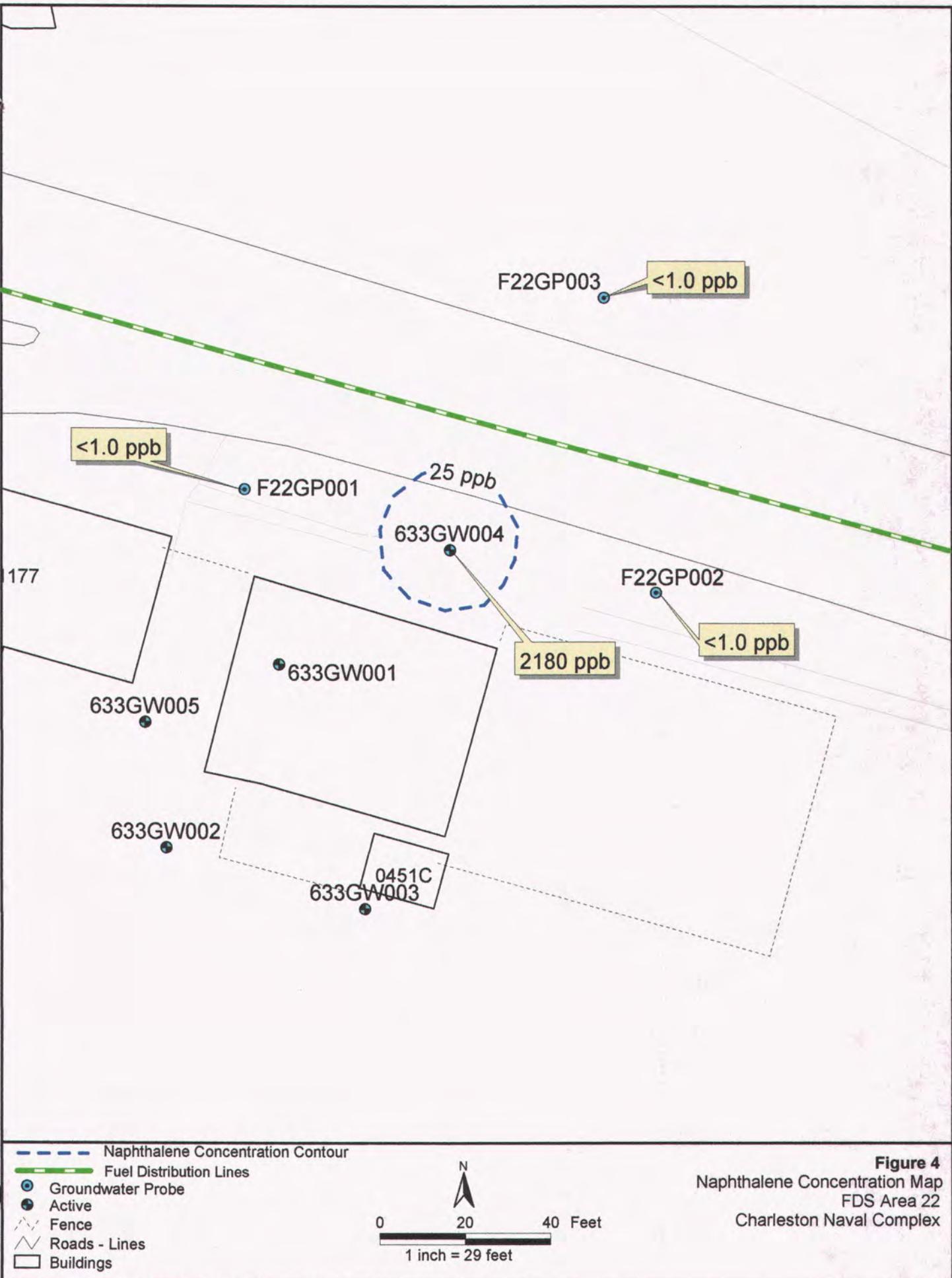
0 2000 4000 Feet  
1 inch = 29 feet

**Figure 1**  
Location Map  
FDS Area 22  
Charleston Naval Complex

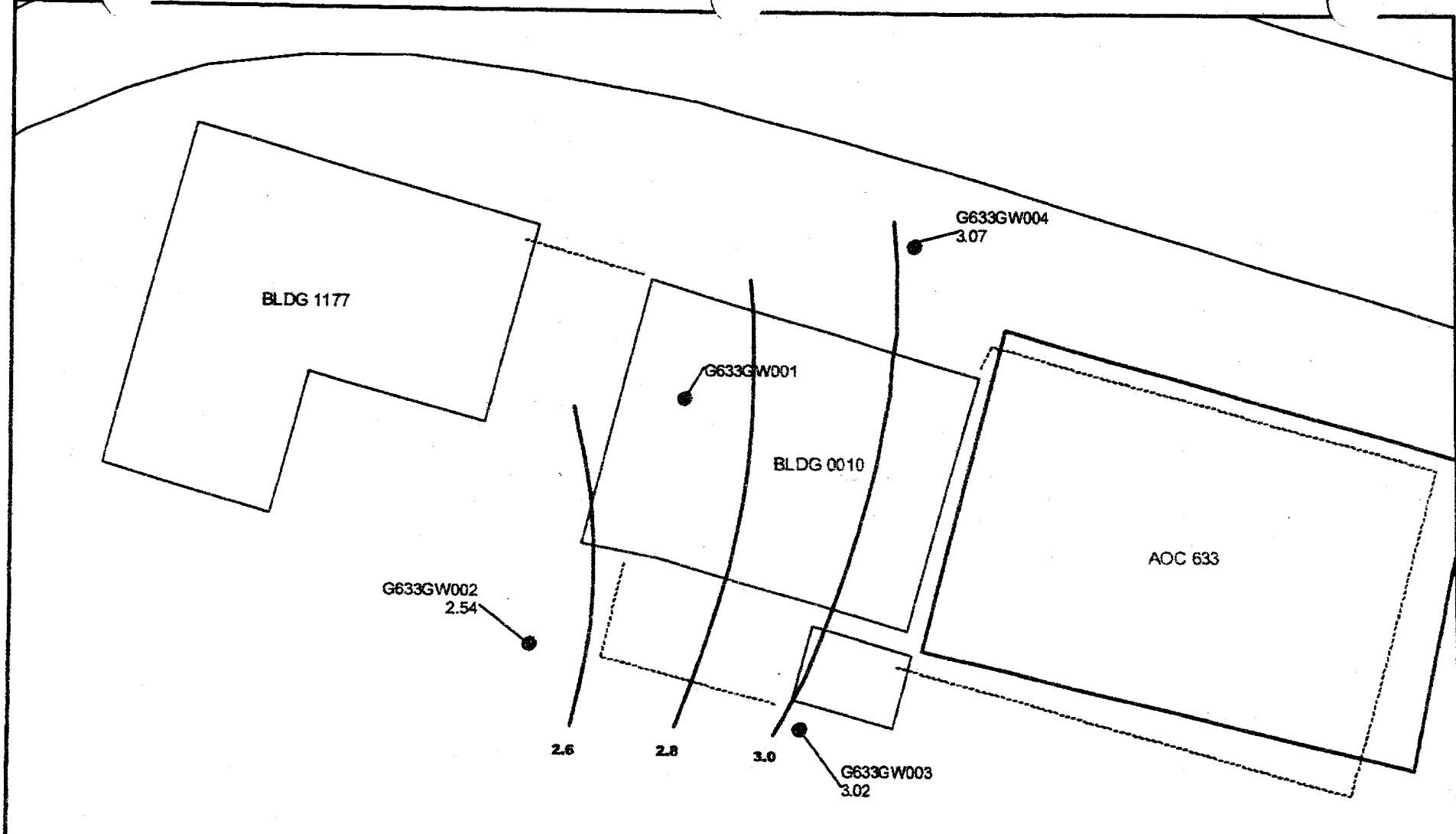




**Figure 3**  
Benzene Concentration Map  
FDS Area 22  
Charleston Naval Complex



NOTE: Original figure  
In color



NOTE: Water level values are in feet, relative to mean sea level (msl).

- Monitoring Well
- ✓ Fence
- ✓ Roads
- ✓ Potentiometric Surface (ft/msl)
- Buildings
- AOC Boundary
- Zone Boundary

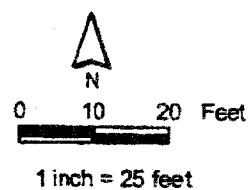


Figure  
Potentiometric Surface (without GW001)  
October 2002  
AOC 633, Zone G  
Charleston Naval Complex

**CH2MHILL**

**Appendix A**  
**Field Data Sheets**



CH2MHILL

## WELL PURGE AND SAMPLING FIELD SHEET

WELL NUMBER: 633GW004

SITE: FDS 22, Zone G

FIELD CREW: Andrew O'Conor

DEPTH TO WATER (FT):	3.61	CASING DIAMETER		GAL/FT OF CASING	
WELL DEPTH (FT):	11.72	2 IN.		0.1632	
WATER COLUMN (FT):	8.11	4 IN.		0.6528	
GAL/FT OF CASING	0.1632	6 IN.		1.4688	
CASING VOLUME (GAL)	1.32	8 IN.		2.611	
NO. OF VOLUMES min.(3)	3	10 IN.		4.0797	
PURGE VOLUME (GAL)	3.96	12 IN.		5.8748	

## METHOD OF PURGING

PUMP: Peristaltic	OTHER:	BAILER : TEFILON, SS ,OTHER:
TIME ON: 1100		BAILER VOL.. (gal) .25 / .33
FLOW RATE (gpm): 0.21		REQUIRED PULLS:
PUMP TIME (min): 18		VOL. PURGED (gals):
VOL. PURGED (gals): 3.9		OTHER:

FIELD PARAMETERS	FIELD MEASUREMENTS					
	Initial	1st	2nd	3rd	5th	6th
TIME	1101	1106	1112	1118		
VOL. (gal)	0	1	2	3		
pH (s.units)	6.59	6.89	6.89	6.91		
COND.(S/m)	12.7	10	10.2	10.5		
TURBIDITY(NTUs)	56.5	0	0	0		
TEMP.(C)	18.75	18.62	18.52	18.63		
DO.(mg/L)	7.39	3.55	2.56	2.36		
ORP(mV)	-266	-304	-333	-344		

## OBSERVATIONS

COLOR:

ODOR: light odor

SAMPLE DATE/ TIME: 5-17-05 / 1120

**Appendix B**

**Waste Disposal Manifest**

**CH2MHILL**  
**CHARLESTON NAVAL COMPLEX**

**CHAMHILL**

Request Number: 074

July 12, 2005

**Request for disposal of purge water generated at the Charleston Naval Complex, Charleston, South Carolina.**

Attached results are from most contaminated wells for each site. Total amount requested for disposal is 12 gallons maximum. Water to be disposed of through Building 1824 system at the Charleston Naval Complex. The information above along with the attached analytical data is correct to the best of my knowledge.

  
CHISHOLM Date 7-12-05

With review of the information provided, North Charleston Sewer District will  will not  approve the discharge of the collected purge water from Building 1824 of the Charleston Naval Complex.

*Kelly S* 7-12-05  
Kelly Singson NCBO Date

**Appendix C  
Laboratory Data Sheets  
DPT's**

## CH2M HILL Chain of Custody/ Laboratory Analysis Form

COC Tracking #: ZFU22-073003-01

page 1 of 2

Laboratory:	GEL	Site Name:								Lab Batch/SDG:  87453%					
Project Name:	Charleston Navy Complex		Zone G, FDS Area 22 SCDHEC No.												
Project Number:			TAT:	14 day											
Project Manager:	Tom Beisei		QA Level:	2											
Address:	GNV: 3011 SW Williston Rd., Gainesville, FL 32605														
Send Report To:	see last page of COC		EDD:	CNC format											
Sample ID	Station ID	Sample Description	Depth		Date & Time Collected	Matrix	# of containers	VOCs (SW8260B) *	HCl		SVOCs (SW8270C)	2 - 1L amber	ALIAS	Comments	
F22GP001N1	GF22GP001	FDS 22 DPT 1	9'	9/4/03 0915		WG	5	X X					UST		
F22GP002N1	GF22GP002	FDS 22 DPT 2	13'	9/4/03 1700		WG	2	X X	one VOC, some SVOC				FDS 22		
<del>F22HP002N1</del>	<del>GF22GP002</del>	<del>FDS 22 DPT 3</del>				WG		X *	NOT collected - NEED dry						
F22GP003N1	GF22GP003	FDS 22 DPT 3	15'	9/4/03 1930		WG	1	X X	one VOC, no SVOC						
F22EP001N1	GF22EP001	BB		9/4/03 1030		WG	5	X *	one VOC, no SVOC						
F22TP001N1	GF22TP001	TB	6/29	10:30		WQ	3	X							
													wall 2's were dry 1 VOC each		
Sampled By: <u>J. A. Smith</u>				Date/Time: 9/4/03		Relinquished by: <u>J. A. Smith</u>				Date/Time: 9/5/03 1535					
Additional Samplers:															
Received By Lab: <u>Albion</u>				Date/Time: 9/5/03 1545		Relinquished by:				Date/Time:					
Received By:				Date/Time:		Shipped Via: UPS FedEx Hand Other Tracking#:				Temperature:					
Remarks:															

Receipt Exceptions: \_\_\_\_\_

**VOCs (SW8260)**

Benzene  
Toluene  
Ethylbenzene  
o-Xylene  
m- & p-Xylene  
Xylenes, total  
MTBE

**SVOCs (SW8270C)**

Naphthalene  
Acenaphthylene  
Acenaphthene  
Fluorene  
Phenanthrene  
Anthracene  
Fluoranthene  
Pyrene  
Benzo(a)anthracene  
Chrysene  
Benzo(b)fluoranthene  
Benzo(k)fluoranthene  
Benzo(a)pyrene  
Indeno(1,2,3-cd)-pyrene  
Dibenz(a,h)-anthracene  
Benzo(g,h,i)perylene

**Reports**

Herb Kelly/GNV - 1 hardcopy, 1 CD  
Tom Beisel/ATL - 1 CD  
Brian Crawford/JAJ - 1 CD

Herb Kelly  
3011 SW Williston Rd  
Gainesville, FL 32608  
Ph: (352) 335 - 5877 ext.2572  
Fax: (352) 271 - 4811

Tom Beisel.  
115 Perimeter Center Place NE, Suite 700  
Atlanta, GA 30346-1278  
Ph: (770) 604 - 9182 ext.367  
Fax: (770) 604 - 9183

JAJones - Brian Crawford and Jed Heames  
CH2M-Jones, LLC  
Charleston Naval Complex  
1849 Avenue F  
North Charleston, SC 29405

Receipt Exceptions:

1A  
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

F22GP001N1
------------

Lab Name: GEL, LLC. Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 87453

Matrix: (soil/water) WATER Lab Sample ID: 87453003

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 9A211

Level: (low/med) LOW Date Received: 09/05/03

% Moisture: not dec. Date Analyzed: 09/09/03

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4-----tert-Butyl methyl ether	_____	1.0   U	
71-43-2-----Benzene	_____	1.0   U	
108-88-3-----Toluene	_____	1.0   U	
100-41-4-----Ethylbenzene	_____	1.0   U	
95-47-6-----o-Xylene	_____	1.0   U	
-----m,p-Xylenes	_____	2.0   U	
1330-20-7-----Xylenes (total)	_____	3.0   U	

1A  
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

F22GP002N1

Lab Name: GEL, LLC.

Contract: N/A

Lab Code: N/A

Case No.: N/A

SAS No.: N/A

SDG No.: 87453

Matrix: (soil/water) WATER

Lab Sample ID: 87453004

Sample wt/vol: 5.000 (g/ml) ML

Lab File ID: 9A218

Level: (low/med) LOW

Date Received: 09/05/03

% Moisture: not dec.

Date Analyzed: 09/09/03

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL)

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

1634-04-4-----tert-Butyl methyl ether	1.0 U
71-43-2-----Benzene	1.0 U
108-88-3-----Toluene	1.0 U
100-41-4-----Ethylbenzene	1.0 U
95-47-6-----o-Xylene	1.0 U
-----m,p-Xylenes	2.0 U
1330-20-7-----Xylenes (total)	3.0 U

1A  
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

F22GP003N1

Lab Name: GEL, LLC.

Contract: N/A

Lab Code: N/A

Case No.: N/A

SAS No.: N/A

SDG No.: 87453

Matrix: (soil/water) WATER

Lab Sample ID: 87453005

Sample wt/vol: 5.000 (g/ml) ML

Lab File ID: 9A219

Level: (low/med) LOW

Date Received: 09/05/03

% Moisture: not dec.

Date Analyzed: 09/09/03

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

CONCENTRATION UNITS:  
CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

1634-04-4-----tert-Butyl methyl ether	1.0 U
71-43-2-----Benzene	1.0 U
108-88-3-----Toluene	1.0 U
100-41-4-----Ethylbenzene	1.0 U
95-47-6-----o-Xylene	1.0 U
-----m,p-Xylenes	2.0 U
1330-20-7-----Xylenes (total)	3.0 U

1B  
SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

F22GP002N1

Lab Name: GEL, LLC.	Contract: N/A		
Lab Code: N/A	Case No.: N/A	SAS No.: N/A	SDG No.: 87453
Matrix: (soil/water) GROUND WAT		Lab Sample ID: 87453004	
Sample wt/vol:	1.000 (g/mL) ML	Lab File ID: S7I1105	
Level:	(low/med) LOW	Date Received: 09/05/03	
% Moisture:	_____ decanted: (Y/N) _____	Date Extracted: 09/09/03	
Concentrated Extract Volume: 1.00 (mL)		Date Analyzed: 09/11/03	
Injection Volume:	0.5 (uL)	Dilution Factor: 10.0	
GPC Cleanup: (Y/N) N			

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	
		Q	
91-20-3-----	Naphthalene	10000	U
208-96-8-----	Acenaphthylene	10000	U
83-32-9-----	Acenaphthene	10000	U
86-73-7-----	Fluorene	10000	U
85-01-8-----	Phenanthrene	10000	U
120-12-7-----	Anthracene	10000	U
206-44-0-----	Fluoranthene	10000	U
129-00-0-----	Pyrene	10000	U
56-55-3-----	Benzo(a)anthracene	10000	U
218-01-9-----	Chrysene	10000	U
205-99-2-----	Benzo(b)fluoranthene	10000	U
207-08-9-----	Benzo(k)fluoranthene	10000	U
50-32-8-----	Benzo(a)pyrene	10000	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10000	U
53-70-3-----	Dibenzo(a,h)anthracene	10000	U
191-24-2-----	Benzo(ghi)perylene	10000	U

1B  
SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

F22GP001N1
------------

Lab Name: GEL, LLC.	Contract: N/A		
Lab Code: N/A	Case No.: N/A	SAS No.: N/A	SDG No.: 87453
Matrix: (soil/water) GROUND WAT		Lab Sample ID: 87453003	
Sample wt/vol:	1040 (g/mL) ML	Lab File ID: S7I1109	
Level:	(low/med) LOW	Date Received: 09/05/03	
% Moisture:	_____ decanted: (Y/N) _____	Date Extracted: 09/09/03	
Concentrated Extract Volume: 1.00 (mL)		Date Analyzed: 09/11/03	
Injection Volume:	0.5 (uL)	Dilution Factor: 1.0	
GPC Cleanup: (Y/N) N			

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
91-20-3-----	Naphthalene	0.96	U	
208-96-8-----	Acenaphthylene	0.96	U	
83-32-9-----	Acenaphthene	0.96	U	
86-73-7-----	Fluorene	0.96	U	
85-01-8-----	Phenanthrene	0.96	U	
120-12-7-----	Anthracene	0.96	U	
206-44-0-----	Fluoranthene	0.96	U	
129-00-0-----	Pyrene	0.96	U	
56-55-3-----	Benzo(a)anthracene	0.96	U	
218-01-9-----	Chrysene	0.96	U	
205-99-2-----	Benzo(b)fluoranthene	0.96	U	
207-08-9-----	Benzo(k)fluoranthene	0.96	U	
50-32-8-----	Benzo(a)pyrene	0.96	U	
193-39-5-----	Indeno(1,2,3-cd)pyrene	0.96	U	
53-70-3-----	Dibenzo(a,h)anthracene	0.96	U	
191-24-2-----	Benzog(hi)perylene	0.96	U	

1A  
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

F22EP001N1

Lab Name: GEL, LLC.

Contract: N/A

Lab Code: N/A

Case No.: N/A

SAS No.: N/A

SDG No.: 87453

Matrix: (soil/water) WATER

Lab Sample ID: 87453002

Sample wt/vol: 5.000 (g/ml) ML

Lab File ID: 9A226

Level: (low/med) LOW

Date Received: 09/05/03

% Moisture: not dec. \_\_\_\_\_

Date Analyzed: 09/09/03

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
1634-04-4-----	tert-Butyl methyl ether _____	1.0 U	
71-43-2-----	Benzene _____	1.0 U	
108-88-3-----	Toluene _____	1.0 U	
100-41-4-----	Ethylbenzene _____	0.35 J	
95-47-6-----	o-Xylene _____	1.0 U	
-----	m,p-Xylenes _____	2.0 U	
1330-20-7-----	Xylenes (total) _____	3.0 U	

**Appendix D**  
**Laboratory Data Sheets**

1A  
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: GEL, LLC.	Contract: N/A	633GW004Q1	
Lab Code: N/A	Case No.: N/A	SAS No.: N/A	SDG No.: 136788
Matrix: (soil/water) GROUND WAT		Lab Sample ID: 136788001	
Sample wt/vol:	5.000 (g/ml) ML	Lab File ID: 9M213	
Level:	(low/med) LOW	Date Received: 05/17/05	
% Moisture:	not dec.	Date Analyzed: 05/31/05	
GC Column: RTX-VOLATILES ID: 0.25 (mm)		Dilution Factor: 1.0	
Soil Extract Volume: _____ (uL)		Soil Aliquot Volume: _____ (uL)	

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3-----	Chloromethane	1.0 U	
75-01-4-----	Vinyl chloride	1.0 U	
74-83-9-----	Bromomethane	1.0 U	
75-00-3-----	Chloroethane	1.0 U	
75-35-4-----	1,1-Dichloroethylene	1.0 U	
67-64-1-----	Acetone	4.4 J	
75-15-0-----	Carbon disulfide	5.0 U	
75-09-2-----	Methylene chloride	5.0 U	
156-60-5-----	trans-1,2-Dichloroethylene	1.0 U	
75-34-3-----	1,1-Dichloroethane	1.0 U	
108-05-4-----	Vinyl acetate	5.0 U	
78-93-3-----	2-Butanone	5.0 U	
156-59-2-----	cis-1,2-Dichloroethylene	1.0 U	
540-59-0-----	1,2-Dichloroethylene (total)	1.0 U	
67-66-3-----	Chloroform	1.0 U	
71-55-6-----	1,1,1-Trichloroethane	1.0 U	
56-23-5-----	Carbon tetrachloride	1.0 U	
107-06-2-----	1,2-Dichloroethane	1.0 U	
71-43-2-----	Benzene	29.9	
79-01-6-----	Trichloroethylene	1.0 U	
78-87-5-----	1,2-Dichloropropane	1.0 U	
75-27-4-----	Bromodichloromethane	1.0 U	
110-75-8-----	2-Chloroethylvinyl ether	5.0 U	
10061-01-5-----	cis-1,3-Dichloropropylene	1.0 U	
108-10-1-----	4-Methyl-2-pentanone	5.0 U	
108-88-3-----	Toluene	13.0	
10061-02-6-----	trans-1,3-Dichloropropylene	1.0 U	
79-00-5-----	1,1,2-Trichloroethane	1.0 U	
591-78-6-----	2-Hexanone	5.0 U	
127-18-4-----	Tetrachloroethylene	1.0 U	
124-48-1-----	Dibromochloromethane	1.0 U	
108-90-7-----	Chlorobenzene	1.0 U	
100-41-4-----	Ethylbenzene	38.8	

FORM I VOA

OLM03.0

1A  
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: GEL, LLC.

Contract: N/A

633GW004Q1

Lab Code: N/A

Case No.: N/A

SAS No.: N/A

SDG No.: 136788

Matrix: (soil/water) GROUND WAT

Lab Sample ID: 136788001

Sample wt/vol: 5.000 (g/ml) ML

Lab File ID: 9M213

Level: (low/med) LOW

Date Received: 05/17/05

% Moisture: not dec.

Date Analyzed: 05/31/05

GC Column: RTX-VOLATILES ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
95-47-6-----	o-Xylene	25.6	
-----	m,p-Xylenes	37.9	
1330-20-7-----	Xylenes (total)	63.5	
100-42-5-----	Styrene	1.0 U	
75-25-2-----	Bromoform	1.0 U	
79-34-5-----	1,1,2,2-Tetrachloroethane	1.0 U	
541-73-1-----	1,3-Dichlorobenzene	1.0 U	
106-46-7-----	1,4-Dichlorobenzene	1.0 U	
95-50-1-----	1,2-Dichlorobenzene	1.0 U	
120-82-1-----	1,2,4-Trichlorobenzene	1.0 U	
87-61-6-----	1,2,3-Trichlorobenzene	1.0 U	

FORM I VOA

OLM03.0

1B  
SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: GEL, LLC.	Contract: N/A	633EW001Q1
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Lab Code: N/A	Case No.: N/A	SAS No.: N/A	SDG No.: 136788
Matrix: (soil/water) WATER		Lab Sample ID: 136788002	
Sample wt/vol:	1000 (g/mL) ML	Lab File ID:	S4E2709
Level: (low/med)	LOW	Date Received:	05/17/05
% Moisture:	decanted: (Y/N)	Date Extracted: 05/20/05	
Concentrated Extract Volume: 1.00 (mL)		Date Analyzed: 05/27/05	
Injection Volume:	0.5 (uL)	Dilution Factor:	1.0
GPC Cleanup: (Y/N) N			

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q	
108-95-2-----	Phenol	6.8	J
111-44-4-----	bis(2-Chloroethyl) ether	10.0	U
95-57-8-----	2-Chlorophenol	10.0	U
100-51-6-----	Benzyl alcohol	10.0	U
108-60-1-----	bis(2-Chloroisopropyl)ether	10.0	U
95-48-7-----	o-Cresol	29.7	
621-64-7-----	N-Nitrosodipropylamine	10.0	U
106-44-5-----	m,p-Cresols	33.9	
67-72-1-----	Hexachloroethane	10.0	U
98-95-3-----	Nitrobenzene	10.0	U
78-59-1-----	Isophorone	10.0	U
88-75-5-----	2-Nitrophenol	10.0	U
105-67-9-----	2,4-Dimethylphenol	86.0	
111-91-1-----	bis(2-Chloroethoxy)methane	10.0	U
120-83-2-----	2,4-Dichlorophenol	10.0	U
65-85-0-----	Benzoic acid	50.0	U
91-20-3-----	Naphthalene	723	E
106-47-8-----	4-Chloroaniline	10.0	U
87-68-3-----	Hexachlorobutadiene	10.0	U
59-50-7-----	4-Chloro-3-methylphenol	10.0	U
91-57-6-----	2-Methylnaphthalene	10.0	U
77-47-4-----	Hexachlorocyclopentadiene	10.0	U
88-06-2-----	2,4,6-Trichlorophenol	10.0	U
95-95-4-----	2,4,5-Trichlorophenol	50.0	U
91-58-7-----	2-Chloronaphthalene	10.0	U
88-74-4-----	o-Nitroaniline	50.0	U
99-09-2-----	m-Nitroaniline	50.0	U
131-11-3-----	Dimethylphthalate	10.0	U
606-20-2-----	2,6-Dinitrotoluene	10.0	U
208-96-8-----	Acenaphthylene	10.0	U
83-32-9-----	Acenaphthene	299	E
51-28-5-----	2,4-Dinitrophenol	50.0	U
132-64-9-----	Dibenzofuran	166	E

1C  
SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: GEL, LLC.	Contract: N/A
633EW001Q1	

Lab Code: N/A	Case No.: N/A	SAS No.: N/A
		SDG No.: 136788
Matrix: (soil/water) WATER		
Sample wt/vol: 1000 (g/mL) ML		
Level: (low/med) LOW		
% Moisture: _____ decanted: (Y/N) _____		
Concentrated Extract Volume: 1.00 (mL)		
Injection Volume: 0.5 (uL)		
Dilution Factor: 1.0		
GPC Cleanup: (Y/N) N		

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	Q
121-14-2-----	2,4-Dinitrotoluene_____	10.0 U
84-66-2-----	Diethylphthalate_____	10.0 U
100-02-7-----	4-Nitrophenol_____	50.0 U
86-73-7-----	Fluorene_____	122 E
7005-72-3-----	4-Chlorophenylphenylether_____	10.0 U
534-52-1-----	2-Methyl-4,6-dinitrophenol_____	50.0 U
100-01-6-----	p-Nitroaniline_____	50.0 U
122-39-4-----	Diphenylamine_____	10.0 U
101-55-3-----	4-Bromophenylphenylether_____	10.0 U
118-74-1-----	Hexachlorobenzene_____	10.0 U
87-86-5-----	Pentachlorophenol_____	50.0 U
85-01-8-----	Phenanthrene_____	120 E
120-12-7-----	Anthracene_____	8.6 J
84-74-2-----	Di-n-butylphthalate_____	10.0 U
206-44-0-----	Fluoranthene_____	15.3 _____
129-00-0-----	Pyrene_____	7.6 J
85-68-7-----	Butylbenzylphthalate_____	10.0 U
56-55-3-----	Benzo(a)anthracene_____	10.0 U
91-94-1-----	3,3'-Dichlorobenzidine_____	20.0 U
218-01-9-----	Chrysene_____	10.0 U
117-81-7-----	bis(2-Ethylhexyl)phthalate_____	10.0 U
117-84-0-----	Di-n-octylphthalate_____	10.0 U
205-99-2-----	Benzo(b)fluoranthene_____	10.0 U
207-08-9-----	Benzo(k)fluoranthene_____	10.0 U
50-32-8-----	Benzo(a)pyrene_____	10.0 U
193-39-5-----	Indeno(1,2,3-cd)pyrene_____	10.0 U
53-70-3-----	Dibenzo(a,h)anthracene_____	10.0 U
191-24-2-----	Benzo(ghi)perylene_____	10.0 U
86-74-8-----	Carbazole_____	104 _____

1B  
SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

633EW001Q1DL
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Lab Name: GEL, LLC. Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 136788

Matrix: (soil/water) WATER Lab Sample ID: 136788002

Sample wt/vol: 1050 (g/mL) ML Lab File ID: S4F0105

Level: (low/med) LOW Date Received: 05/17/05

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Extracted: 05/20/05

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 06/01/05

Injection Volume: 0.5 (uL) Dilution Factor: 40.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2-----	Phenol	381 U	
111-44-4-----	bis(2-Chloroethyl) ether	381 U	
95-57-8-----	2-Chlorophenol	381 U	
100-51-6-----	Benzyl alcohol	381 U	
108-60-1-----	bis(2-Chloroisopropyl)ether	381 U	
95-48-7-----	o-Cresol	381 U	
621-64-7-----	N-Nitrosodipropylamine	381 U	
106-44-5-----	m,p-Cresols	381 U	
67-72-1-----	Hexachloroethane	381 U	
98-95-3-----	Nitrobenzene	381 U	
78-59-1-----	Isophorone	381 U	
88-75-5-----	2-Nitrophenol	381 U	
105-67-9-----	2,4-Dimethylphenol	80.6 DJ	
111-91-1-----	bis(2-Chloroethoxy)methane	381 U	
120-83-2-----	2,4-Dichlorophenol	381 U	
65-85-0-----	Benzoic acid	1900 U	
91-20-3-----	Naphthalene	2180 D	
106-47-8-----	4-Chloroaniline	381 U	
87-68-3-----	Hexachlorobutadiene	381 U	
59-50-7-----	4-Chloro-3-methylphenol	381 U	
91-57-6-----	2-Methylnaphthalene	50.4 DJ	
77-47-4-----	Hexachlorocyclopentadiene	381 U	
88-06-2-----	2,4,6-Trichlorophenol	381 U	
95-95-4-----	2,4,5-Trichlorophenol	1900 U	
91-58-7-----	2-Chloronaphthalene	381 U	
88-74-4-----	o-Nitroaniline	1900 U	
99-09-2-----	m-Nitroaniline	1900 U	
131-11-3-----	Dimethylphthalate	381 U	
606-20-2-----	2,6-Dinitrotoluene	381 U	
208-96-8-----	Acenaphthylene	381 U	
83-32-9-----	Acenaphthene	418 D	
51-28-5-----	2,4-Dinitrophenol	1900 U	
132-64-9-----	Dibenzofuran	214 DJ	

1C  
SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: GEL, LLC.	Contract: N/A	633EW001Q1DL
Lab Code: N/A	Case No.: N/A	SAS No.: N/A
Matrix: (soil/water) WATER	Lab Sample ID: 136788002	
Sample wt/vol: 1050 (g/mL) ML	Lab File ID: S4F0105	
Level: (low/med) LOW	Date Received: 05/17/05	
% Moisture: _____ decanted: (Y/N) _____	Date Extracted: 05/20/05	
Concentrated Extract Volume: 1.00 (mL)	Date Analyzed: 06/01/05	
Injection Volume: 0.5 (uL)	Dilution Factor: 40.0	
GPC Cleanup: (Y/N) N		

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
121-14-2-----	2,4-Dinitrotoluene _____	381 U	
84-66-2-----	Diethylphthalate _____	381 U	
100-02-7-----	4-Nitrophenol _____	1900 U	
86-73-7-----	Fluorene _____	130 DJ	
7005-72-3-----	4-Chlorophenylphenylether _____	381 U	
534-52-1-----	2-Methyl-4,6-dinitrophenol _____	1900 U	
100-01-6-----	p-Nitroaniline _____	1900 U	
122-39-4-----	Diphenylamine _____	381 U	
101-55-3-----	4-Bromophenylphenylether _____	381 U	
118-74-1-----	Hexachlorobenzene _____	381 U	
87-86-5-----	Pentachlorophenol _____	1900 U	
85-01-8-----	Phenanthrene _____	145 DJ	
120-12-7-----	Anthracene _____	9.6 DJ	
84-74-2-----	Di-n-butylphthalate _____	381 U	
206-44-0-----	Fluoranthene _____	13.0 DJ	
129-00-0-----	Pyrene _____	381 U	
85-68-7-----	Butylbenzylphthalate _____	381 U	
56-55-3-----	Benzo(a)anthracene _____	381 U	
91-94-1-----	3,3'-Dichlorobenzidine _____	762 U	
218-01-9-----	Chrysene _____	381 U	
117-81-7-----	bis(2-Ethylhexyl)phthalate _____	381 U	
117-84-0-----	Di-n-octylphthalate _____	381 U	
205-99-2-----	Benzo(b)fluoranthene _____	381 U	
207-08-9-----	Benzo(k)fluoranthene _____	381 U	
50-32-8-----	Benzo(a)pyrene _____	381 U	
193-39-5-----	Indeno(1,2,3-cd)pyrene _____	381 U	
53-70-3-----	Dibenzo(a,h)anthracene _____	381 U	
191-24-2-----	Benzo(ghi)perylene _____	381 U	
86-74-8-----	Carbazole _____	102 DJ	